

GRANT FUNDING OPPORTUNITY

Examining the Effects of Hydrogen in End-Use Appliances for Large Commercial Buildings and Industrial Applications

PIER Natural Gas Program



GFO-21-503

<http://www.energy.ca.gov/contracts/index.html>

State of California

California Energy Commission

September/2021

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ATTACHMENTS

Attachment Number	Title of Section
1	Application Form (<i>requires signature</i>)
2	Executive Summary
3	Project Narrative
4	Project Team
5	Scope of Work
6	Project Schedule
7	Budget
8	CEQA Compliance Form
9	References and Work Product
10	Commitment and Support Letters (<i>require signature</i>)
11	Project Performance Metrics
12	Applicant Declaration (<i>require signature</i>)
13	California Based Entity (CBE) Form
14	References for Calculating Energy End-Use and GHG Emissions
15	Contact List

I. Introduction

NOTE ABOUT SIGNATURES

The CEC **may** have waived the requirement for a signature on application materials for this solicitation for submissions. If a notice, regarding CEC's waiver of the signature requirement appears here: <https://www.energy.ca.gov/funding-opportunities/solicitations>, the waiver applies to this solicitation. In the event of a conflict between the notice and any language in this solicitation regarding signatures, the notice will govern.

Even if the requirement for signatures has been waived, applicants are still expected to adhere to the requirements of this solicitation as if they had signed.

The waiver applies to Attachment 1 (Application Form), Attachment 10 (Commitment and Support Letters), and Attachment 12 (Applicant Declaration). All these attachments must be completed, where indicated, and included with your application. If you are an awardee, the CEC will require wet or certified electronic signatures for these attachments within 30 days after posting of the Notice of Proposed Award.

Acceptable certified electronic signatures:

- Electronic signatures that lock the file from further editing after signing are required).
- Certified electronic signatures created using Adobe Acrobat or DocuSign, with the feature selected to lock the file after signing and saving, are acceptable.
- Certified electronic signature programs, other than Adobe Acrobat and DocuSign, must be approved by the CEC prior to use. Please work with your assigned Commission Agreement Manager to determine if the certified electronic signature program is acceptable.

A. PURPOSE OF SOLICITATION

The purpose of this solicitation is to fund a technical study to identify the impact of the potential use of hydrogen and hydrogen-natural gas blends on existing appliances as a potential decarbonization strategy for large commercial buildings and the industrial sector. The study will identify operating parameters such as the maximum concentration of hydrogen that can be handled by existing equipment with and without modification. This study will inform policymakers and the private sector of the potential for hydrogen and hydrogen-natural gas blends as a decarbonization strategy for industrial and large commercial building applications. Up to \$1.5 million is available for this solicitation.

While California is the vanguard of clean energy, it still relies heavily on natural gas to meet some of its energy needs. About 37 percent of natural gas in California is used for industrial processing and 12 percent for commercial buildings. Natural gas use in these sectors contribute significant greenhouse gases emissions primarily due to combustion to supply heat and process energy. Using hydrogen or hydrogen-natural gas blends may be an option to reduce GHG emissions and decarbonize the large commercial building and industrial sectors. However, the potential technoeconomic effects of using hydrogen or hydrogen-natural gas blends in end-use appliances and equipment in these sectors is not well understood. There is uncertainty on air quality impacts, operational performance, safety, and potential equipment modification needs. Thus, research is

needed to identify the parameters by which hydrogen and hydrogen-natural gas blends can be used safely for large commercial building and industrial applications. The intent of this research is to address this knowledge gap with a comprehensive study which identifies key benefits and challenges associated with hydrogen and hydrogen-natural gas blends in end-use appliances and equipment.

This solicitation supports the California Energy Commission's (CEC) research initiative on *Examining the Effects of Hydrogen in End-Use Appliances* in the Fiscal Year 2020-2021¹ Natural Gas Research and Development Program Budget Plan.

See Part II of this solicitation for project eligibility requirements. Applications will be evaluated as follows: Stage One proposal screening and Stage Two proposal scoring. If an applicant submits multiple applications, each application must be for a distinct project (i.e., no overlap with respect to the tasks described in the Scope of Work).

Prospective applicants looking for partnering opportunities for this funding opportunity should register on the California Energy Commission's Empower Innovation website at www.empowerinnovation.net

¹ Chen, Peter. 2020. Energy Research and Development Division. 2020. *Natural Gas Research and Development Program Proposed Budget Plan for Fiscal Year 2020-21*. California Energy Commission. Publication Number: CEC-500-2020-081.

B. KEY WORDS/TERMS

Word/Term	Definition
Applicant	The entity that submits an application to this solicitation.
Application	An applicant's written response to this solicitation.
Authorized Representative	<i>Authorized Representative</i> , the person signing the application form who has authority to enter into an agreement with the CEC.
CAM	<i>Commission Agreement Manager</i> , the person designated by the CEC to oversee the performance of an agreement resulting from this solicitation and to serve as the main point of contact for the Recipient.
CAO	Commission Agreement Officer
CBE	California Based Entity
CBO	Community Based Organization. A public or private nonprofit organization of demonstrated effectiveness that: <ul style="list-style-type: none"> a) Has an office in the region (e.g., air basin or county) and meets the demographic profile of the communities they serve. b) Has deployed projects and/or outreach efforts within the region (e.g., air basin or county) of the proposed disadvantaged or low-income community. c) Has an official mission and vision statements that expressly identifies serving disadvantaged and/or low-income communities. d) Currently employs staff member(s) who specialized in and are dedicated to – diversity, or equity, or inclusion, or is a 501(c)(3) non-profit.
CEC	State Energy Resources Conservation and Development Commission or, the California Energy Commission.
CEQA	California Environmental Quality Act, California Public Resources Code Section 21000 et seq.
Days	<i>Days refers to calendar days.</i>
Disadvantaged Community	These are communities in the top 25% scoring areas from CalEnviroScreen along with other areas with high amounts of pollution and low populations. (https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30)
Industrial Sector ²	A sector that consists of all facilities and equipment used for producing, processing, or assembling goods. Major energy use in this sector is largely for process heating.
Large Commercial Buildings	<i>Large commercial buildings</i> are buildings greater than 100,000 square feet that are used for non-residential purposes, such as hospitals,

² Source: U.S. Energy Information Administration (June 2021)

Word/Term	Definition
	institutional buildings (e.g., schools and colleges), offices, and correctional facilities.
Low Income Community	a) <i>Low-income Communities</i> are defined as communities within census tracts with median household incomes at or below 80 percent of the statewide median income or the applicable low-income threshold listed in the state income limits updated by the Department of Housing and Community Development. (https://www.hcd.ca.gov/grants-funding/income-limits/state-and-federal-income-limits.shtml)
NG IOU	<i>Natural Gas Investor-owned utility</i> , including Pacific Gas and Electric Co., San Diego Gas and Electric Co., and Southern California Gas Co.
NOPA	<i>Notice of Proposed Award</i> , a public notice by the CEC that identifies award recipients.
NOx	<i>Nitrogen Oxides (Oxides Of Nitrogen, NOx)</i> A general term pertaining to compounds of nitric oxide (NO), nitrogen dioxide (NO ₂) and other oxides of nitrogen. Nitrogen oxides are typically created during combustion processes and are major contributors to smog formation and acid deposition. NO ₂ is a criteria air pollutant and may result in numerous adverse health effects.
Pre-Commercial Technology	<i>Pre-commercial Technology</i> means a technology that has not reached commercial maturity or been deployed at scales sufficiently large and in conditions sufficiently reflective of anticipated actual operating environments to enable the appraisal of operational and performance characteristics, or of financial risks.
Pilot Test	<i>Pilot test</i> means small scale testing in the laboratory or testing on a small portion of the production line of the affected industry. Pilot tests help to verify the design and validity of an approach, and adjustments can be made at this stage before full-scale demonstrations
PM _{2.5}	Includes tiny particles with an aerodynamic diameter less than or equal to a nominal 2.5 microns. This fraction of particulate matter penetrates most deeply into the lungs.
Principal Investigator	The technical lead for the applicant's project, who is responsible for overseeing the project; in some instances, the Principal Investigator and Project Manager may be the same person.
Project Manager	The person designated by the applicant to oversee the project and to serve as the main point of contact for the CEC.
Project Partner	An entity or individual that contributes financially or otherwise to the project (e.g., match funding, provision of a test, demonstration or deployment site), and does not receive CEC funds.
Recipient	An entity receiving an award under this solicitation.
Solicitation	This entire document, including all attachments, exhibits, any addendum and written notices, and questions and answers

Word/Term	Definition
	("solicitation" may be used interchangeably with "Grant Funding Opportunity").
State	State of California
TRL	Technology readiness levels are a method for estimating the maturity of technologies during the acquisition phase of a program. Source: U.S. Department of Energy, "Technology Readiness Assessment Guide". https://www2.lbl.gov/dir/assets/docs/TRL%20guide.pdf

C. PROJECT FOCUS

Examining the Effects of Hydrogen in End-Use Appliances for Large Commercial Buildings and Industrial Applications Solicitation

This solicitation will result in a techno-economic study that will identify the impact of hydrogen and hydrogen-natural gas blends on existing appliances used in the large commercial building and industrial sectors. It will also identify operating parameters such as the maximum concentration of hydrogen that can be handled by this equipment with and without modification.

The use of hydrogen and hydrogen-natural gas blends could change combustion characteristics because of the differences in physical and chemical properties. The addition of hydrogen could also pose safety and performance issues such as embrittlement, flame flashback, flame stability, wet flame gas, gas flow changes, reduced radiative heat transfer, impacts on criteria air pollutant emissions and energy efficiency, system differences in control and safety, and other unforeseen complications in end-use applications which could change the characteristics of the resulting product.

The research must address these knowledge gaps and identify key benefits, challenges and potential solutions associated with using hydrogen and hydrogen-natural gas blends in end-use appliances for large commercial buildings and industrial applications. The result will inform policymakers and the private sector of the technical and economic feasibility of this strategy and identify additional research, demonstration, and infrastructure necessary to enable large-scale deployment. The transfer of knowledge gained from this study is the primary goal.

This study will focus on end-use applications for hydrogen and hydrogen-natural gas blends. The production, storage of and/or conveyance of hydrogen outside of the appliance and/or equipment are not covered by this GFO.

The Technical Merit in the **Project Narrative** (Attachment 3) must address the following:

- Explain how hydrogen and hydrogen-natural gas blending can help decarbonize the large commercial building and industrial sector and help the state reach its GHG reduction goals. Responses should be quantitative, discuss hydrogen-natural gas blending's market potential, and include all assumptions.
- Describe how the study can be used by key stakeholders (e.g., policymakers, project developers, utilities, other researchers, etc.)

- c. Describe the advantage of the proposed study over what is currently available and being used by key stakeholders.
- d. Describe the approach and reasons for selecting representative end-use appliances and/or equipment to be evaluated and the commercial buildings and industries sectors to be targeted
 - i. This representative sample should prioritize appliances and equipment with the highest potential to decarbonize the commercial building and industrial sectors.
 - ii. Selected appliances or equipment can include, but are not limited to, hot water boilers, steam boilers, gas driven chillers, furnaces, and other different types of combustion technologies.
 - iii. If proposals choose to test boilers, there is a 300,000 Btu/hr. minimum capacity.

The Technical Approach in the **Project Narrative** (Attachment 3) must do the following:

- a. Address how appliance/equipment modifications will be made to work universally among different makes and models to handle the new fuel.
- b. Describe the existing studies that will be used to determine the “safe” limit for hydrogen-natural gas blends.
- c. Describe your approach to managing and designing tests to address possible pressure and hydrogen concentration fluctuations. This is to address potential Btu content fluctuations observed in the current natural gas system.
- d. Describe how your project team will design laboratory experiments to determine greenhouse gas emission reductions, air emission reductions (e.g., criteria pollutants), and increased safety.
- e. Describe how appliance end-users will participate in the study to provide information on customer acceptance, cost burden, user experience, safety concerns, and general deployment.
- f. Describe how appliance and equipment manufacturers will participate in the study to provide information on technical feasibility, modifications needed, and additional cost requirements.
 - i. Include specific manufacturers to participate in the Technical Advisory Committee (TAC) or as project partners.
 - ii. A minimum of two manufacturers per appliance or equipment tested in the study is required.
- g. Discuss how the information will be shared with equipment manufacturers, government agencies, and others.

The Technical Tasks in Part III of the **Scope of Work** (Attachment 5) must incorporate plans to accomplish the following technical objectives:

- a. Develop methodology for categorizing and selecting a representative sample of existing end-use appliances and equipment used in large commercial buildings and industries to be evaluated.

- i. End-use appliances would be categorized based on sector and application.
 - ii. Different makes and models of each end-use appliance would be considered and tested.
- b. Establishing criteria for “safe” use of hydrogen and hydrogen-natural gas blends in appliances and equipment. This definition may vary depending on the end-use appliance, application, and industry requirements.
 - i. Criteria should address safety concerns such as visibility of hydrogen flame, flame flashback lower ignition energy than natural gas, and ignition over a wide range of concentration in the air.
- c. Conducting laboratory experiments to properly identify the maximum upper limit of hydrogen blended with natural gas that could be “safely” used in end-use appliances. These experiments would involve:
 - i. Ensuring modified appliances and equipment can manage fluctuations of hydrogen concentration. This addresses Btu content fluctuations seen in the current natural gas system.
 - ii. Examining and testing the effects of hydrogen-natural gas blended fuel on appliances, such as materials, performance, and flame stability.
 - iii. Exploring retrofits, modifications or re-designs needed to enable higher concentrations of hydrogen beyond the maximum upper limit and/or 100% hydrogen (e.g., controls and burner modifications).
 - iv. Identifying specific appliances and equipment specifications needed to enable hydrogen-natural gas blended with higher concentrations of hydrogen at or beyond the maximum upper limit, including 100% hydrogen.
- d. Estimating the cost of retrofitting or modifying appliances and equipment to accommodate hydrogen-natural gas blended with higher concentrations of hydrogen up to 100

percent. Note, preliminary tests show commercial appliances can handle hydrogen concentration as high as 20 percent.

- e. Estimating the cost of manufacturing appliances and equipment to accommodate higher blends of hydrogen.
- f. Measuring the impact of varying levels of hydrogen on the carbon intensity of natural gas-fueled appliances and overall contribution to state climate and energy goals.
- g. Measure the environmental impacts of varying levels of hydrogen (e.g., NO_x and PM_{2.5} pollutant concentration).
- h. Optimizing fuel composition to produce the least amount of criteria air pollutants and maximize lean stability limits.
- i. Comparing the economics of using varying levels of hydrogen in hydrogen-natural gas blends versus other methods for decarbonization, such as electrification, for industrial and large commercial building applications
- j. Identifying future challenges and research needed to improve the techno-economics and performance of hydrogen-natural gas blending for large commercial and industrial applications.
 - i. Explain and quantify the fuel and equipment costs and evaluate the economic potential of blending hydrogen in future appliances and equipment using pure natural gas as the baseline.

D. FUNDING

1. Amount Available and Minimum/ Maximum Funding Amounts

There is **up to \$1,500,000** available for the grants awarded under this solicitation. The minimum funding amount for the project is **\$750,000**. The maximum funding amount is **\$1,500,000**.

Project Group	Available funding	Minimum award amount	Maximum award amount	Minimum match funding (% of Natural Gas Funds Requested)
Group Examining the Effects of Hydrogen in End-Use Appliances for Large Commercial Buildings and Industrial Applications	\$1,500,000	\$750,000	\$1,500,000	0%

2. Match Funding Requirement

Match funding is not required for this solicitation. However, applications that include match funding will receive additional points during the scoring phase (see Scoring Criteria in Section IV F).

For the definition of match funding see Section I. K.

3. Change in Funding Amount

Along with any other rights and remedies available to it, the California Energy Commission (CEC) reserves the right to:

- Increase or decrease the available funding and the minimum/maximum award amounts described in this section.
- Allocate any additional or unawarded funds to passing applications, in rank order.
- Reduce funding to an amount deemed appropriate if the budgeted funds do not provide full funding for agreements. In this event, the Recipient and Commission Agreement Manager will reach agreement on a reduced Scope of Work commensurate with available funding.

E. KEY ACTIVITIES SCHEDULE

Key activities, dates, and times for this solicitation and for agreements resulting from this solicitation are presented below. An addendum will be released if the dates change for activities that appear in **bold**.

ACTIVITY	DATE	TIME ³
Solicitation Release	September 28, 2021	
Pre-Application Workshop	October 14, 2021	10:00 a.m.
Deadline for Written Questions⁴	October 28, 2021	5:00 p.m.
Anticipated Distribution of Questions and Answers	November 11, 2021	

³ Pacific Standard Time or Pacific Daylight Time, whichever is being observed.

⁴ This deadline does not apply to non-technical questions (e.g., questions concerning application format requirements or attachment instructions) or to questions that address an ambiguity, conflict, discrepancy, omission, or other error in the solicitation. Such questions may be submitted to the Commission Agreement Officer listed in Section G at any time prior to the application deadline. Please see Section G for additional information.

ACTIVITY	DATE	TIME ³
Deadline to Submit Applications	November 22, 2021	5:00 p.m.
Anticipated Notice of Proposed Award Posting Date	January 17, 2022	
Anticipated Energy Commission Business Meeting Date	March 9, 2022	
Anticipated Agreement Start Date	April 1, 2022	
Anticipated Agreement End Date	April 31, 2026	

F. NOTICE OF PRE-APPLICATION WORKSHOP

CEC staff will hold one Pre-Application Workshop to discuss the solicitation with potential applicants. Participation is optional but encouraged. The Pre-Application Workshop will be held remotely. Applicants may attend the workshop via the internet (Zoom, see instructions below), or via conference call on the date and at the time and location listed below. Please call (916) 654-4381 or refer to the CEC's website at www.energy.ca.gov/contracts/index.html to confirm the date and time.

Date and time: October 14, 2021 at 10:00 AM (Pacific Time US and Canada)

Zoom Instructions:

To join the Zoom meeting, go to <https://zoom.us/join> and enter the Meeting ID below and select "join from your browser". Participants will then enter the meeting password listed below and their name. Participants will select the "Join" button.

Meeting ID: 917 3070 2369

Meeting Password: meeting@10

Topic: Pre-Application Workshop – GFO-21-503 Examining the Effects of Hydrogen in End-Use Appliances for Large Commercial Buildings and Industrial Applications

Telephone Access Only:

Call **1-888 475 4499** (Toll Free) or **1-877 853 5257** (Toll Free). When prompted, enter the meeting number above. International callers may select a number from the Zoom International Dial-in Number List at: <https://energy.zoom.us/u/adjzKUXvoy>. To comment, dial *9 to "raise your hand" and *6 to mute/unmute your phone line.

Access by Mobile Device:

Download the application from the Zoom Download Center, <https://energy.zoom.us/download>.

Technical Support:

- For assistance with problems or questions about joining or attending the meeting, please call Zoom Technical Support at **1-888-799-9666 ext. 2**. You may also contact the Public Advisor's Office at publicadvisor@energy.ca.gov, or 800-822-6228.
- System Requirements: To determine whether your computer is compatible, visit: <http://support.zoom.us/hc/en-us/articles/201362023-System-requirements-for-Windows>
- If you have a disability and require assistance to participate, please Erica Rodriguez by e-mail at Erica.Rodriguez@energy.ca.gov or (916) 764-5705 at least five days in advance.

G. QUESTIONS

During the solicitation process, direct questions to the Commission Agreement Officer listed below:

Tonya Heron, Commission Agreement Officer
California Energy Commission
715 P Street, MS-18
Sacramento, California, 95814
Telephone: (916) 827-8343
E-mail: [Tonya.Heron @energy.ca.gov](mailto:Tonya.Heron@energy.ca.gov)

Applicants may ask questions at the Pre-Application Workshop, and may submit written questions via mail, electronic mail, and by FAX. However, all **technical** questions must be received by the deadline listed in the "Key Activities Schedule" above. Questions received after the deadline may be answered at the CEC's discretion. **Non-technical** questions (e.g., questions concerning application format requirements or attachment instructions) may be submitted to the Commission Agreement Officer (CAO) at any time prior the application deadline.

The questions and answers will also be posted on the Commission's website at: <https://www.energy.ca.gov/funding-opportunities/solicitations>

If an applicant discovers a **conflict, discrepancy, omission, or other error** in the solicitation at any time prior to the application deadline, the applicant may notify the CEC in writing and request modification or clarification of the solicitation. The CEC, at its discretion will provide modifications or clarifications by either an addendum to the solicitation or by written notice to all entities that requested the solicitation. At its discretion, the CEC may, in addition to any other actions it may choose, re-open the question/answer period to provide all applicants the opportunity to seek any further clarification required.

Any verbal communication with a Commission employee concerning this solicitation is not binding on the State and will in no way alter a specification, term, or condition of the solicitation. Therefore, all communication should be directed in writing to the assigned CAO.

H. APPLICANTS' ADMONISHMENT

This solicitation contains application requirements and instructions. Applicants are responsible for **carefully reading** the solicitation, asking appropriate questions in a timely manner, ensuring that all solicitation requirements are met, submitting all required responses in a complete manner by the required date and time, and **carefully rereading** the solicitation before submitting an application. In particular, please carefully read the **Screening/Scoring Criteria and Grounds for Rejection** in Part IV, and the relevant PIER Grant terms and conditions located at: <https://www.energy.ca.gov/funding-opportunities/funding-resources>.

Applicants are solely responsible for the cost of developing applications. This cost cannot be charged to the State. All submitted documents will become publicly available records upon the posting of the Notice of Proposed Award.

I. ADDITIONAL REQUIREMENTS

- Time is of the essence. Funds available under this solicitation have encumbrance deadlines as early as June 30, 2022. This means that the CEC must approve proposed awards at a business meeting (usually held monthly) prior to June 30, 2022 in order to avoid expiration of the funds. Prior to approval and encumbrance, the CEC must comply with the California Environmental Quality Act (CEQA). To comply with CEQA, the Commission must have CEQA-related information from applicants and sometimes other entities, such as local governments, in a timely manner. Unfortunately, even with this information, the Commission may not be able to complete its CEQA review prior to the encumbrance deadline for every project. For example, if a project requires an Environmental Impact Report, the process to complete it can take many months. For these reasons, it is critical that applicants organize project proposals in a manner that minimizes the time required for the Commission to comply with CEQA and provide all CEQA-related information to the Commission in a timely manner such that the Commission is able to complete its review in time for it to meet its encumbrance deadline.
- Reservation of right to cancel proposed award. In addition to any other right reserved to it under this solicitation or that it otherwise has, if the CEC determines, in its sole and absolute discretion, that the CEQA review associated with a proposed project would not likely be completed prior to the encumbrance deadline referenced above, and that the Commission's ability to meet its encumbrance deadline may thereby be jeopardized, the CEC may cancel a proposed award and award funds to the next highest scoring applicant, regardless of the originally proposed applicant's diligence in submitting information and materials for CEQA review. Examples of situations that may arise related to CEQA review include but are not limited to:
 - Example 1: If another state agency or local jurisdiction, such as a city or county, has taken the role of lead agency under CEQA, the CEC's review may be delayed while waiting for a determination from the lead agency.
 - Example 2: If the proposed work is part of a larger project for which a detailed environmental analysis has been or will be prepared by another state agency

or local jurisdiction, the CEC's review may be delayed as a result of waiting for a supplemental or initial analysis, respectively, from the other agency.

- Example 3: If the nature of the proposed work is such that a project is not categorically or otherwise exempt from the requirements of CEQA, and an initial study or other detailed environmental analysis appears to be necessary, the CEC's review, or the lead agency's review, may take longer than the time available to encumber the funds. If an initial study or environmental impact report has already been completed by another state agency or a local jurisdiction, serving as the lead agency, the applicant must ensure that such an analysis covers the work in the proposed project, or must obtain a revised analysis and determination from the lead agency reviewing the proposed project.
- Example 4: If the proposed project clearly falls under a statutory or categorical exemption or is project for which another state agency or local jurisdiction has already adopted a CEQA finding that the project will cause no significant effect on the environment, the project will likely have greater success in attaining rapid completion of CEQA requirements.

The above examples are not exhaustive of instances in which the CEC may or may not be able to comply with CEQA within the encumbrance deadline and are only provided as further clarification for potential applicants. Please plan project proposals accordingly.

J. BACKGROUND

1. Natural Gas R&D Program⁵

This solicitation will award projects under the Natural Gas program, which is funded by a ratepayer surcharge on natural gas consumed by ratepayers of NG IOUs in California (see California Public Utilities Code section 890 and 895). The California Public Utilities Commission (CPUC) designated the California Energy Commission as administrator of the program in August 2004⁶. The purpose of the program is to benefit California natural gas ratepayers by funding public interest research and development activities, which the CPUC has defined as "developing science or technology, the benefits of which accrues to California citizens and are not adequately addressed by competitive or regulated entities."⁷

2. Program Areas, Strategic Objectives, and Funding Initiatives

⁵ See Public Resources Code section 25620

https://leginfo.ca.gov/faces/codes_displayText.xhtml?lawCode=PRC&division=15.&title=&part=&chapter=7.1.&article=

⁶ See CPUC Decision 04-08-010, August 19, 2004, http://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/39314.PDF.

⁷ *Id.* at pp. 25 and 46.

Natural Gas R&D projects must fall within one or more specific focus areas (“**research initiatives**”) identified in the Natural Gas R&D Budget Plan. This solicitation targets the following research initiative(s) from the Natural Gas R&D Budget Plan for Fiscal Year 2020/ 2021⁸:

Natural Gas R&D Budget Plan for Fiscal Year 2020/2021

- **Research Area:** Applied Research and Development
 - **Research Initiative** Examining the Effects of Hydrogen in End-Use Appliances

- **Applicable Laws, Policies, and Background Documents**

This solicitation addresses the energy goals described in the following laws, policies, and background documents.

Laws/Regulations

- **Assembly Bill (AB) 32⁹ - Global Warming Solutions Act of 2006**

AB 32 created a comprehensive program to reduce greenhouse gas (GHG) emissions in California. GHG reduction strategies include a reduction mandate of 1990 levels by 2020 and a cap-and-trade program. AB 32 also required the California Air Resources Board (ARB) to develop a Scoping Plan that describes the approach California will take to reduce GHGs. ARB must update the plan every five years.

Additional information: http://www.leginfo.ca.gov/pub/15-16/bill/sen/sb_0001-0050/sb_32_bill_20160908_chaptered.htm

Applicable Law: California Health and Safety Code §§ 38500 et. seq.

- **Senate Bill (SB) 32 - California Global Warming Solutions Act of 2006: emissions limit**

AB 32 designates the State Air Resources Board as the state agency charged with monitoring and regulating sources of greenhouse gas (GHG) emissions. The state board is required to approve a statewide GHG emissions limit equivalent to the statewide GHG emissions level in 1990 to be achieved by 2020 and to adopt rules and regulations in an open public process to achieve the maximum, technologically feasible, and cost-effective GHG emissions reductions. This requires the state board to ensure that statewide GHG emissions are reduced to 40% below the 1990 level by 2030.

Additional information: <https://ww3.arb.ca.gov/cc/scopingplan/scopingplan.htm>

- **AB 758, Building Efficiency¹⁰**

⁸ Chen, Peter. 2021. *Natural Gas Research and Development Program Proposed Budget Plan for Fiscal Year 2020-21*. California Energy Commission. Publication Number: CEC-500-2020-081 <https://www.energy.ca.gov/sites/default/files/2021-04/CEC-500-2020-081.pdf>

⁹ AB 32 (Statutes of 2006, chapter 488)

¹⁰ AB 758 (Statutes of 2009, chapter 470)

AB 758 requires the Energy Commission to collaborate with the California Public Utilities Commission and stakeholders to develop a comprehensive program to achieve greater energy and water savings in existing residential and nonresidential buildings. The Energy Commission developed the *Existing Buildings Energy Action Plan* in August 2015.

Additional information:
https://ww2.energy.ca.gov/efficiency/existing_buildings/documents/ab_758_bill_20091011_chaptered.pdf

Applicable Law: California Public Resources Code § 25943, California Public Utilities Code §§ 381.2 and 385.2

- **SB 350¹¹ Clean Energy and Pollution Reduction Act of 2015,**

SB 350 does the following: 1) expands California's RPS goals and requires retail sellers of electricity and local publicly owned electricity to increase their procurement of eligible renewable energy resources; 2) requires the Energy Commission to establish annual targets for statewide energy efficiency savings in electricity and natural gas final end uses of retail customers by January 1, 2030; and 3) provide for transformation of the Independent System Operator into a regional organization.

Additional information: http://www.leginfo.ca.gov/pub/15-16/bill/sen/sb_0301-0350/sb_350_bill_20151007_chaptered.htm

- **Appliance Efficiency Regulations**

The Energy Commission promulgates appliance efficiency regulations that require manufacturers of various new appliances sold or offered for sale in California to test them using specified test methods. Covered appliances include refrigerators, air conditioners, heaters, plumbing fitting/fixtures, lighting, washers, dryers, cooking products, electric motors, transformers, power supplies, televisions, and battery charger systems.

Additional information: <http://www.bsc.ca.gov/>; <http://www.energy.ca.gov/appliances/>
Applicable Law: California Code of Regulations, Title 20, Division 2, Chapter 4, Article 4, §§ 1601 et. seq.

- **California Energy Code**

The Energy Code is a component of the California Building Standards Code and is published every three years through the collaborative efforts of state agencies including the California Building Standards Commission and the Energy Commission. The Code ensures that new and existing buildings achieve energy efficiency and preserve outdoor and indoor environmental quality through use of the most energy efficient technologies and construction.

Additional information: <http://www.energy.ca.gov/title24/>
Applicable Law: California Code of Regulations, Title 24, Part 6 and associated administrative regulations in Part 1

Policies/Plans

¹¹ SB 350 (Statutes of 2015, chapter 547)

- **CPUC Resolution G-3555**

The Resolution provided guidance from the CPUC to explore opportunities for hydrogen use that can reduce system GHG emissions, consider the health impacts associated with gas usage inside homes, and assess the effects of hydrogen delivered through the existing natural gas pipeline network on end-use appliances.

Additional information:

<https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M310/K136/310136145.PDF>

- **Executive Order B-55-18**

Governor Brown's Executive Order B-55-18 sets a goal that the entire California economy achieve carbon neutrality by 2045 and achieve and maintain net negative emissions thereafter (circumscribed by the Governor's authority). This goal is in addition to existing statewide targets of reducing greenhouse gas emissions. The Executive Order directs the ARB to work with relevant state agencies to ensure future Scoping Plans identify and recommend measures to achieve the carbon neutrality goal.

Additional Information: <https://www.ca.gov/archive/gov39/wp-content/uploads/2018/09/9.10.18-Executive-Order.pdf>

- **Executive Order N-19-19**

Governor Newsom's Executive Order N-19-19 requires that "every aspect of state government redouble its effort to reduce GHG emissions and mitigate impacts of climate change while building a sustainable, inclusive economy." It calls on the creation of a Climate Investment Framework that leverages the state's \$700 billion investment portfolio to advance the State's climate leadership, protect taxpayers, and support the creation of high-road jobs.

Additional Information: <https://www.gov.ca.gov/wp-content/uploads/2019/09/9.20.19-Climate-EO-N-19-19.pdf>

- **Integrated Energy Policy Report (Biennial)**

California Public Resources Code Section 25302 requires the Energy Commission to release a biennial report that provides an overview of major energy trends and issues facing the state. The IEPR assesses and forecasts all aspects of energy industry supply, production, transportation, delivery, distribution, demand, and pricing. The Energy Commission uses these assessments and forecasts to develop energy policies and provide recommendations for future research and analysis areas.

Additional information: <http://www.energy.ca.gov/energypolicy>

Applicable Law: California Public Resources Code § 25300 et seq.

- **CPUC's Energy Efficiency Strategic Plan (2008)**

The Energy Efficiency Strategic Plan creates a roadmap for achieving energy efficiency within the residential, commercial, industrial, and agricultural sectors. The plan was updated in January 2011 to include a lighting chapter.

Additional information: <http://www.cpuc.ca.gov/general.aspx?id=4125>

- **California's Existing Buildings Energy Efficiency Action Plan**

The Existing Buildings Energy Efficiency Action Plan provides a 10-year roadmap to activate market forces and transform California's existing residential, commercial, and public building stock into high performing and energy efficient buildings. The Plan provides a comprehensive framework centered on five goals, each with an objective and a series of strategies to achieve it. Each strategy includes industry and/or government implementation partners. Water related items are addressed in several of the strategies from the Existing Buildings Energy Efficiency Action Plan including but not limited to strategies 1.5, 2.2, 4.1, and 5.7 from the plan.

Additional Information:

<https://www.energy.ca.gov/programs-and-topics/programs/energy-efficiency-existing-buildings>

- **2019 California Energy Efficiency Action Plan**

The Energy Efficiency Action Plan expands on the Existing Buildings Energy Action Plan and includes topics related to existing buildings' energy efficiency, low-income barriers to energy efficiency, and doubling energy efficiency by 2030. The SB 350 Doubling of Energy Efficiency by 2030 report expands beyond existing buildings to include agriculture, industry, newly constructed buildings, conservation voltage reduction, and electrification. This report combines these topics with the Existing Buildings Energy Efficiency Action Plan to create a comprehensive statewide energy efficiency action plan.

Additional information: https://ww2.energy.ca.gov/efficiency/existing_buildings/

- **Executive Order B-29-15**

Governor Brown's Executive Order B-29-15 proclaims the severity of the drought conditions in California and directs the Energy Commission to invest in new technologies that will achieve water and energy savings and greenhouse gas reductions.

Reference Documents

Refer to the link below for information about past CEC research projects and activities associated with natural gas appliance decarbonization:

Hansell, James (Guidehouse), Karin Corfee (Guidehouse), Bill Goetzler (Guidehouse), Vania Fong (Guidehouse), Gregg Ander (Gregg D. Ander, LLC), Matthew Tisdale (Gridworks), Mac Roche (Gridworks), and Rick Halperin (GC Green, Inc.). 2021. Distributed Energy Resources Integration Research Roadmap. California Energy Commission. Publication Number: CEC-500-2021-010.

California Energy Commission. 2019. Joint Agency Workshop on the Senate Bill 100 Report. <https://www.energy.ca.gov/event/workshop/2019-09/joint-agency-workshop-senate-bill-100-report>

California Energy Commission. 2019. Webinar on Renewable Hydrogen Production Plant Deployment Roadmap. <https://www.energy.ca.gov/event/webinar/2019-08/webinar-renewable-hydrogen-production-plant-deployment-roadmap>

California Energy Commission. 2020. DRAFT 2021 SB 100 Joint Agency Report. <https://www.energy.ca.gov/event/workshop/2020-12/notice-senate-bill-100-draft-report-workshop>

California Energy Commission. 2021. Scoping Workshop – Upcoming Solicitation Regarding Pilot test and Demonstration of Hydrogen Blending into Existing California Natural Gas System. <https://www.energy.ca.gov/event/workshop/2021-03/scoping-workshop-upcoming-solicitation-regarding-pilot-test-and>

McDonell, Vincent; Zhao, Yan; Choudhury, Shiny. (University of California Irvine, Combustion Laboratory- UCICL). 2020. Implications of Increased Renewable Natural Gas on Emissions and Stability Behavior of Appliances. California Energy Commission. Publication Number: CEC-500-2020-070
<https://www2.energy.ca.gov/2020publications/CEC-500-2020-070/CEC-500-2020-070.pdf>

Reed, Jeffrey, Emily Dailey, Brendan Shaffer, Blake Lane, Robert Flores, Amber Fong, G. Scott Samuelsen. 2020. Roadmap for the Deployment and Buildout of Renewable Hydrogen Production Plants in California. CEC. Publication Number: CEC-600-2020-002.

Schwartz, Harrison, Sabine Brueske. 2020. Utility-Scale Renewable Energy Generation Technology Roadmap. California Energy Commission. Publication Number: CEC-500-2020-062.

Uy, Kevin. 2019. Natural Gas Research and Development Program Proposed Program Plan and Funding Request for Fiscal Year 2019-20. California Energy Commission Research and Development Division. Publication Number: CEC-500-2019-035
<https://www2.energy.ca.gov/2019publications/CEC-500-2019-035/CEC-500-2019-035.pdf>

Other California Energy Commission Research Reports and Publications:
<https://www.energy.ca.gov/energy-rd-reports-n-publications>

K. MATCH FUNDING

- **“Match funds”** includes cash or in-kind (non-cash) contributions provided by the applicant, subcontractors, or other parties including pilot testing, demonstration, and/or deployment sites (e.g., test site staff services) that will be used in performance of the proposed project.

“Match funds” do not include: CEC awards, future/contingent awards from other entities (public or private), the cost or value of the project work site, or the cost or value of structures or other improvements affixed to the project work site permanently or for an indefinite period of time (e.g., photovoltaic systems).

Definitions of “match funding” categories are listed below:

- **“Cash” match** means funds that are in the recipient’s possession or proposed by match partner and clearly identified in a support letter, and are reserved for the proposed project, meaning that they have not been committed for use or pledged as match for any other project. Cash match can include funding awards earned or received from other agencies for the proposed technologies or study (but not for the identical work). Proof that the funds exist as cash is required. Cash match will be considered more favorably than in-kind contributions during the scoring phase.
- **“In-Kind” match** is typically in the form of the value of personnel, goods, and services, including direct and indirect costs. This can include equipment, facilities, and other property as long as the value of the contribution is based on documented market values or book values, prorated for its use in the project, and depreciated or amortized over the term of the project using generally accepted accounting principles (GAAP).
- **Match** funds must be spent only during the agreement term, either before or concurrently with CEC funds. Match funds also must be reported in invoices submitted to the CEC.
- All applicants providing match funds must submit commitment letters, **including prime and subcontractors**, that: (1) identify the source(s) of the funds; (2) justify the dollar value claimed; (3) provide an unqualified (i.e., without reservation or limitation) commitment that guarantees the availability of the funds for the project; and (4) provide a strategy for replacing the funds if they are significantly reduced or lost. Please see Attachment 11, Commitment and Support Letter Form. Commitment and support letters must be submitted with the application to be considered.
- Any match pledged in Attachment 1 must be consistent with the amount or dollar value described in the commitment letter(s) (e.g., if \$5,000 “cash in hand” funds are pledged in a commitment letter, Attachment 1 must match this amount). Only the total amount pledged in the commitment letter(s) will be considered for match funding points.
- Examples of preferred match share:
 - **“Travel”** refers to all travel required to complete the tasks identified in the Scope of Work. Travel includes in-state and out-of-state, and travel to conferences. CEC funds are limited to lodging and any form of transportation (e.g., airfare, rental car, public transit, parking, mileage). Use of match funds for out-of-state travel is encouraged, as the CEC discourages and may not approve the use of its funds for such travel. If an applicant plans to travel to conferences, including registration fees, they must use match funds. Applicants shall adhere to travel restrictions of using state funds to travel to certain other states pursuant to AB 1887 (2016) and codified at California Government Code Section 11139.8. All applicants are encouraged to consider the Attorney General’s website <https://oag.ca.gov/ab1887> for a current list of states subject to travel restrictions. Awarded Grants under this solicitation shall not contain travel paid for with Commission funds (applicants can instead use match funds) to the listed states unless the Commission approves in writing that the trip falls within one of the exceptions under the law.
 - **“Equipment”** is an item with a unit cost of at least \$5,000 and a useful life of at least one year. **Purchasing equipment with match funding is encouraged** as there are no disposition requirements at the end of the agreement for such equipment. Typically, grant recipients may continue to use equipment purchased with CEC funds if the use is consistent with the intent of the original agreement.

- **“Materials”** under Materials and Miscellaneous are items under the agreement that do not meet the definition of Equipment (unit cost of at least \$5,000 and a useful life of at least one year). **Using match funds for purchasing items such as laptops, notebooks and/or personal tablets is encouraged, as Energy Commission funds for these purchases is not allowed.**

L. FUNDS SPENT IN CALIFORNIA AND CALIFORNIA-BASED ENTITIES

- Only CEC reimbursable funds counts towards funds spent in California and funds spent on California-Based Entities totals.
- "Spent in California" means that:
 - (1) Funds in the "Direct Labor category and all categories calculated based on direct labor (e.g., fringe benefits, indirect costs and profit) are paid to individuals that pay California state income taxes on wages received for work performed under the agreement. Payments made to out-of-state workers do not count as “funds spent in California.” However, funds spent by out-of-state workers in California (e.g., hotel and food) can count as “funds spent in California.”; AND
 - (2) Business transactions (e.g., material and equipment purchases, leases, and rentals) are entered into with a business located in California.
 - (3) Total should include any applicable subcontractors.
- Airline ticket purchases for out-of-state travel and payments made to out-of-state workers are not considered funds “spent in California.” However, funds spent by out-of-state workers in California (e.g. lodging) and airline travel originating and ending in California are considered funds “spent in California.” A business located in California means: 1) businesses registered with Secretary of State AND 2) transaction is with a location in California that is directly related to the grant project (e.g., direct purchase of material and equipment to be used in the grant) and results in the support of California business and jobs.
 - Example 1: Grant funds will be spent on temperature sensors. The temperature sensors are manufactured in Texas. The recipient orders the temperature sensors directly from a CA based supply house. The invoice shows that the transaction occurred with the CA based supply house. This transaction is eligible and can be counted as funds spent in CA.
 - Example 2: Grant funds will be spent on temperature sensors. The temperature sensors are manufactured in Texas. The recipient orders the temperature sensors directly from Texas. The manufacturer has training centers in CA that instructs purchasers on how to use the sensors. The invoice shows that the transaction occurred in Texas. This transaction is not eligible and cannot be counted as funds spent in CA.
- Pursuant to California Public Resources Code Section 25620.5(h), the California Energy Commission’s Natural Gas Program must give priority to “California-Based Entities” (CBEs) when making awards. California Public Resources Code Section 25620.5(i) defines “CBE” as a corporation or other business entity organized for the transaction of business that either:
 - Has its headquarters in California AND manufactures in California the product that is the subject of the award; or

- Has an office for the transaction of business in California and substantially manufactures the product or substantially performs the research within California that is the subject of the award.
- Applications must meet the following requirements in order to receive CBE preference points:
 - The proposal must include a CBE as either the recipient or a subcontractor.
 - The budget must show that the CBE(s) will receive more than 60.00% of the funds awarded.

II. Applicant Eligibility Requirements

A. ELIGIBILITY

This solicitation is open to all public and private entities. Demonstration projects in this solicitation must be located in the service territory of a California natural gas Investor Owned Utility (NG IOU), which includes Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Gas Company. All projects in this solicitation must benefit natural gas IOU ratepayers.

B. TERMS AND CONDITIONS

Each grant agreement resulting from this solicitation will include terms and conditions that set forth the recipient's rights and responsibilities. By signing the Application Form (Attachment 1), each applicant agrees to enter into an agreement with the CEC to conduct the proposed project according to the terms and conditions that correspond to its organization, without negotiation: (1) University of California and California State University terms and conditions; (2) U.S. Department of Energy terms and conditions; or (3) standard terms and conditions. All terms and conditions are located at <http://www.energy.ca.gov/research/contractors.html>. Please refer to the applicable PIER Natural Gas Grant terms and conditions. Failure to agree to the terms and conditions by taking actions such as failing to sign the Application Form or indicating that acceptance is based on modification of the terms will result in **rejection** of the application. Applicants **must read** the terms and conditions carefully. The CEC reserves the right to modify the terms and conditions prior to executing grant agreements.

C. CALIFORNIA SECRETARY OF STATE REGISTRATION

All corporations, limited liability companies (LLCs), limited partnerships (LPs) and limited liability partnerships (LLPs) that conduct intrastate business in California are required to be registered and in good standing with the California Secretary of State prior to its project being recommended for approval at an CEC Business Meeting. If not currently registered with the California Secretary of State, applicants are encouraged to contact the Secretary of State's Office as soon as possible to avoid potential delays in beginning the proposed project(s) (should the application be successful). For more information, contact the Secretary of State's Office via its website at www.sos.ca.gov. Sole proprietors using a fictitious business name must be registered with the appropriate county and provide evidence of registration to the CEC prior to their project being recommended for approval at an CEC Business Meeting.

III. Application Organization and Submission Instructions

A. APPLICATION FORMAT, PAGE LIMITS, AND NUMBER OF COPIES

The following table summarizes the application formatting and page limit recommendations:

The CEC may have waived the requirement for a signature on application materials for this solicitation. If a notice regarding CEC's waiver of the signature requirement appears here: <https://www.energy.ca.gov/funding-opportunities/solicitations>, the waiver applies to this solicitation. In the event of a conflict between the notice and any language in this solicitation regarding signatures, the notice will govern.

Format	<ul style="list-style-type: none">• Font: 11-point, Arial (excluding Excel spreadsheets, original template headers and footers, and commitment or support letters)• Margins: No less than one inch on all sides (excluding headers and footers)• Spacing: Single spaced, with a blank line between each paragraph• Signatures: Wet signatures only (i.e., not electronic)• File Format: MS Word version 2007 or later (.doc or .docx format), excluding Excel spreadsheets and commitment or support letters (PDF files are acceptable for the letters)
Maximum Page Limit Recommendations	<ul style="list-style-type: none">• Executive Summary (Attachment): two pages• Project Narrative Form (Attachment): twenty pages excluding documentation for CEQA• Project Team Form (Attachment): two pages for each resume• Reference and Work Product Form (Attachment): one page for each reference, two pages for each project description• Commitment and Support Letter Form (Attachment): two pages, excluding the cover page• Scope of Work (Attachment): thirty pages• Project Schedule (Attachment): four pages• There are no page limits for the following:<ul style="list-style-type: none">○ Application Form (Attachment)○ Budget Forms (Attachment)○ CEQA Compliance Form (Attachment)○ Project Performance Metrics (Attachment)

B. PREFERRED METHOD FOR DELIVERY

The preferred method of delivery for this solicitation is the Energy Commission Grant Solicitation System, available at: <https://gss.energy.ca.gov/>. This online tool allows applicants to submit their electronic documents to the CEC prior to the date and time specified in this solicitation. Electronic files must be in Microsoft Word XP (.doc format) and Excel Office Suite formats unless originally provided in the solicitation in another format. Attachments requiring

signatures may be scanned and submitted in PDF format. Completed Budget Forms, Attachment 7, must be in Excel format. **The system will not allow applications to be submitted after the application due date and time.**

First time users must register as a new user to access the system. Applicants will receive a confirmation email after all required documents have been successfully uploaded. A tutorial of the system will be provided at the pre-application workshops and you may contact the Commission Agreement Officer identified in the Questions section of the solicitation for more assistance.

C. HARD COPY DELIVERY

Due to COVID-19, hard copies will not be accepted for this solicitation. Please refer to the above Section III.B for online submission instructions.

D. APPLICATION ORGANIZATION AND CONTENT

1. Submit attachments in numerical order.
2. Label the proposal application cover “Grant Funding Opportunity GFO-21-503” and include: (a) the title of the application; and (b) the applicant’s name.
3. Separate each section of the application by Attachment number and section title indicated below.

Below is a description of each required section of the application. Completeness in submitting are the required information requested in each attachment will be factored into the scoring:

1. Application Form (Attachment 1)

This form requests basic information about the applicant and the project. The application includes an original form that includes all requested information. The application must be signed by an authorized representative of the applicant’s organization or will be failed as indicated in Section IV.E.

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2. Executive Summary Form (Attachment 2)

The Executive Summary includes: a project description; the project goals and objectives to be achieved; an explanation of how the goals and objectives will be achieved, quantified, and measured; and a description of the project tasks and overall management of the agreement.

3. Project Narrative Form (Attachment 3)

This form will include the majority of the applicant's responses to the Scoring Criteria in Section IV, including the following which must be addressed for both Applied Research & Technology Demonstration projects:

a. Project Readiness

- Include information about the permitting required for the project and whether or not the permitting has been completed. If complete, provide appropriate documentation. If local jurisdiction CEQA review and project approval is not complete, applications must include information documenting progress towards and a schedule for achieving compliance under CEQA within the timeframes specified in this solicitation (see Section I.D). All supporting documentation must be included in Attachment 8.

4. Project Team Form (Attachment 4)

Identify by name all key personnel¹² assigned to the project, including the project manager and principal investigator (if applicable), and individuals employed by any major subcontractor (a major subcontractor is a subcontractor receiving at least 25% of Commission funds or \$100,000, whichever is less). Clearly describe their individual areas of responsibility. Include the information required for each individual, including a resume (maximum two pages, printed double-sided).

5. Scope of Work Template (Attachments 5)

Applicants must include a completed Scope of Work for each project, as instructed in the template. The Scope of Work identifies the tasks required to complete the project. See requirements in section III.A.

Electronic files for the Scope of Work must be in **MS Word** file format.

6. Project Schedule (Attachment 6)

The Project Schedule includes a list of all products, meetings, and due dates. All work must be scheduled for completion by the "Key Dates" section of this solicitation manual.

Electronic files for the Project schedule must be in **MS Excel** file format.

7. Budget Forms (Attachment 7)

The budget forms are in MS Excel format. Detailed instructions for completing them are included at the beginning of Attachment 7. **Read the instructions before completing the worksheets.** Complete and submit information on **all** budget worksheets. The salaries, rates, and other costs entered on the worksheets will become a part of the final agreement.

- 1) All project expenditures (match share and reimbursable) must be made within the approved agreement term. Match share requirements are discussed in Part I of this solicitation. The entire term of the agreement and projected rate increases must be considered when preparing the budget.

¹² "Key personnel" are individuals that are critical to the project due to their experience, knowledge, and/or capabilities.

- 2) The budget must reflect estimates for **actual** costs to be incurred during the agreement term. The CEC may only approve and reimburse for actual costs that are properly documented in accordance with the grant terms and conditions. Rates and personnel shown must reflect the rates and personnel the applicant would include if selected as a Recipient.
- 3) The proposed rates are considered capped and may not change during the agreement term. The Recipient will only be reimbursed for **actual** rates up to the rate caps.
- 4) The budget must NOT include any Recipient profit from the proposed project, either as a reimbursed item, match share, or as part of overhead or general and administrative expenses (subcontractor profit is allowable, though the maximum percentage allowed is 10 % of the total subcontractor rates for labor, and other direct and indirect costs as indicated in the Category Budget form). Please review the terms and conditions and budget forms for additional restrictions and requirements.
- 5) The budget must allow for the expenses of all meetings and products described in the Scope of Work. Meetings may be conducted at the CEC or by conference call, as determined by the Commission Agreement Manager.
- 6) Applicants must budget for permits and insurance. Permitting costs may be accounted for in match share. Permit costs and the expenses associated with obtaining permits are not reimbursable under this Agreement with CEC funds, with the exception of costs incurred by University of California recipients.
- 7) The budget must NOT identify that CEC funds will be spent outside of the United States or for out-of-country travel. However, match funds may cover these costs if there are no legal restrictions.
- 8) All applicants should go to the Attorney General's website <https://oag.ca.gov/ab1887> for a current list of states subject to travel restrictions. Grants awarded under this solicitation shall not contain travel paid for with Commission funds (applicants can instead use match funds) to the listed states unless the Commission approves in writing that the trip falls within one of the exceptions under the law.
- 9) **Prevailing wage requirement:** Projects that receive an award of public funds from the CEC often involve construction, alteration, demolition, installation, repair or maintenance work over \$1,000. For this reason, projects that receive an award of public funds from the CEC are likely to be considered public works under the California Labor Code. See Chapter 1 of Part 7 of Division 2 of the California Labor Code, commencing with Section 1720 and Title 8, California Code of Regulations, Chapter 8, Subchapter 3, commencing with Section 16000.

Projects deemed to be public works require among other things the payment of prevailing wages, which can be significantly higher than non-prevailing wages.

By accepting this grant, Recipient as a material term of this agreement shall be fully responsible for complying with all California public works requirements including but not limited to payment of prevailing wage. Therefore, as a material term of this grant, Recipient must either:

- (a) Proceed on the assumption that the project is a public work and ensure that:
 - (i) prevailing wages are paid; and

- (ii) the project budget for labor reflects these prevailing wage requirements; and
- (iii) the project complies with all other requirements of prevailing wage law including but not limited to keeping accurate payroll records, and complying with all working hour requirements and apprenticeship obligations;

or,

- (b) Timely obtain a legally binding determination from the Department of Industrial Relations or a court of competent jurisdiction before work begins on the project that the proposed project is not a public work.

8. California Environmental Quality Act (CEQA) Compliance Form (Attachment 8)

The CEC requires the information on this form to facilitate its evaluation of proposed activities under CEQA (California Public Resources Code Section 21000 et. seq.), a law that requires state and local agencies in California to assess the potential environmental impacts of their proposed actions. The form will also help applicants to determine CEQA compliance obligations by identifying which proposed activities may be exempt from CEQA and which activities may require additional environmental review. If proposed activities are exempt from CEQA (such as paper studies), the worksheet will help to identify and document this. This form must be completed regardless of whether the proposed activities are considered a "project" under CEQA.

Failure to complete the CEQA process in a timely manner after the CEC's Notice of Proposed Award may result in the cancellation of a proposed award and allocation of funding elsewhere, such as to the next highest-scoring project.

9. Reference and Work Product Form (Attachment 9)

- 1) Section 1: Provide applicant and subcontractor references as instructed.
- 2) Section 2: Provide a list of past projects detailing technical and business experience of the applicant (or any member of the project team) that is related to the proposed work. Identify past projects that resulted in market-ready technology, advancement of codes and standards, and/or advancement of state energy policy. Include copies of up to three of the applicant or team member's recent publications in scientific or technical journals related to the proposed project, as applicable.

10. Commitment and Support Letter Form (Attachment 10)

A commitment letter commits an entity or individual to providing the service or funding described in the letter. A support letter details an entity or individual's support for the project. Commitment and Support Letters must be submitted with the application. Letters that are not submitted by the application deadline will not be reviewed and counted towards meeting the requirement specified in the solicitation.

3) Commitment Letters

Applicants must submit a **match funding** commitment letter signed by each representative of the entity or individual that is committing to providing match funding. The letter should: (1) identify the source(s) of the funds; and (2) guarantee the availability of the funds for the project.

- If the project involves pilot testing activities, the applicant must include a site commitment letter signed by an authorized representative of the proposed test site. The letter must: (1) identify the location of the site (street address, parcel number, tract map, plot map, etc.) which must be consistent with Attachments 1 and 8. and (2) commit to providing the site for the proposed activities.
- **Project partners** that are making contributions other than match funding or a test site, and are not receiving CEC funds, must submit a commitment letter signed by an authorized representative that: (1) identifies how the partner will contribute to the project; and (2) commits to making the contribution.

4) Support Letters

All applicants must include at least one support letter from a project stakeholder (i.e., an entity or individual that will benefit from or be involved in the project) that: (1) describes the stakeholder's interest or involvement in the project; (2) indicates the extent to which the project has the support of the relevant industry and/or organizations; and (3) describes any support it intends (but does not necessarily commit) to provide for the project, such as funding or the provision of a **test** site.

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11. Project Performance Metrics (Attachment 11)

The purpose of this questionnaire is to identify and document 5-7 performance targets for the project. The performance targets should be a combination of scientific, engineering and techno-economic metrics that provide the most significant indicator of the research or technology's potential success.

12. Applicant Declaration (Attachment 12)

This form requests the applicant declare that they: are not delinquent on taxes nor suspended by the California Franchise Tax Board; are not being sued by any public agency or entity; are in compliance with the terms of all settlement agreements, if any, entered into with the Energy Commission or another public agency or entity; are in compliance with all judgments, if any, issued against the Applicant in any matter to which the Energy Commission or another public agency or entity is a party; are complying with any demand letter made on the Applicant by the Energy Commission or another public agency or entity; and are not in active litigation with the Energy Commission regarding the Applicant's actions under a current or past contract, grant, or loan with the Energy Commission. The declaration must be signed under penalty of perjury by an authorized representative of the applicant's organization.

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13. California Based Entity (CBE) Form (Attachment 13)

Identify any California-based entities as instructed in the form. California-based entities are entitled to a scoring preference as described in Part IV of this solicitation.

IV. Evaluation and Award Process

A. APPLICATION EVALUATION

Applications will be evaluated and scored based on responses to the information requested in this solicitation and on any other information available, such as on past performance of CEC agreements. To evaluate applications, the CEC will organize an Evaluation Committee that consists primarily of CEC staff. The Evaluation Committee may use technical expert reviewers to provide an analysis of applications. Applications will be evaluated in two stages:

1. Stage One: Application Screening

The Contracts, Grants, and Loans Office and/or the Evaluation Committee will screen applications for compliance with the Screening Criteria in **Section E** of this Part. **Applications that fail any of the screening criteria will be rejected.** The Evaluation Committee may conduct optional telephone **Clarification Interviews** with applicants during the screening process to clarify and/or verify information submitted in the application. However, these interviews may not be used to change or add to the content of the original application. Applicants will not be reimbursed for time spent answering clarifying questions.

2. Stage Two: Application Scoring

Applications that pass Stage One will be submitted to the Evaluation Committee for review and scoring based on the Scoring Criteria in **Section F** of this Part.

- The scores for each application will be the average of the combined scores of all Evaluation Committee members.
- Clarification Interviews: The Evaluation Committee may conduct optional telephone interviews with applicants during the evaluation process to clarify and/or verify information submitted in the application. However, these interviews may not be used to change or add to the content of the original application. Applicants will not be reimbursed for time spent answering clarifying questions.
- **A minimum score of 70.0 points** is required for criteria 1-7- to be eligible for funding. In addition, the application must receive a minimum score of **52.50 points for criteria 1–4** to be eligible for funding.

B. RANKING, NOTICE OF PROPOSED AWARD, AND AGREEMENT DEVELOPMENT

1. Ranking and Notice of Proposed Award

Applications that receive at least the minimum required score for all criteria will be ranked according to their score.

- CEC staff will post a **Notice of Proposed Award (NOPA)** that includes: (1) the total proposed funding amount; (2) the rank order of applicants; and (3) the amount of each proposed award. The CEC will post the NOPA at its headquarters in Sacramento and on its website, and will mail it to all entities that submitted an application. Proposed awards must be approved by the CEC at a business meeting.
- **Debriefings:** Unsuccessful applicants may request a debriefing after the release of the

NOPA by contacting the Commission Agreement Officer listed in Part I. A request for debriefing must be received **no later than 30 calendar days** after the NOPA is released.

- In addition to any of its other rights, the CEC reserves the right to:
 - Allocate any additional funds to passing applications, in rank order; and
 - Negotiate with successful applicants to modify the project scope, schedule, project team entity that will receive the award, location and/or level of funding.

2. Agreements

Applications recommended for funding will be developed into a proposed grant agreement to be considered at a CEC Business Meeting. Recipients may begin the project only after full execution of the grant agreement (i.e., approval at a CEC business meeting and signature by the Recipient and the CEC).

- **Agreement Development:** The Contracts, Grants, and Loans Office will send the Recipient a grant agreement for approval and signature. The agreement will include the applicable terms and conditions and will incorporate this solicitation and the application by reference. The CEC reserves the right to modify the award documents (including the terms and conditions) prior to executing any agreement.
- **Failure to Execute an Agreement:** If the CEC is unable to successfully execute an agreement with an applicant in a timely manner, it reserves the right to cancel the pending award and use the funds elsewhere, such as to fund the next highest-ranked, eligible application.

C. GROUNDS TO REJECT AN APPLICATION OR CANCEL AN AWARD

Applications that do not pass the screening stage will be rejected. In addition, the CEC reserves the right to reject an application and/or to cancel an award for any reason, including any of the following:

- The application contains false or intentionally misleading statements or references that do not support an attribute or condition contended by the applicant.
- The application is intended to erroneously and fallaciously mislead the State in any way.
- The application does not comply or contains caveats that conflict with the solicitation, and the variation or deviation is material.
- The applicant has previously received funding through an EPIC or Public Interest Energy Research (PIER) agreement, has received the royalty review letter (which the CEC annually sends out to remind past recipients of their obligations to pay royalties), and has not responded to the letter or is otherwise not in compliance with repaying royalties.
- The applicant has received unsatisfactory agreement evaluations from the CEC or another California state agency.
- The applicant is a business entity required to be registered with the California Secretary of State and is not in good standing.
- The applicant has not demonstrated that it has the financial capability to complete the project.
- The applicant fails to meet CEQA compliance within sufficient time for the CEC to meet its encumbrance deadline or any other deadlines, as the CEC in its sole and absolute discretion may determine.
- The applicant has included a statement or otherwise indicated that it will not accept the terms and conditions, or that acceptance is based on modifications to the terms and conditions.

- The application contains confidential information or identifies any portion of the application as confidential.

D. MISCELLANEOUS

1. Solicitation Cancellation and Amendment

It is the policy of the CEC not to solicit applications unless there is a bona fide intention to award an agreement. However, if it is in the State's best interest, the CEC reserves the right, in addition to any other rights it has, to do any of the following:

- Cancel this solicitation;
- Revise the amount of funds available under this solicitation;
- Amend this solicitation as needed; and/or
- Reject any or all applications received in response to this solicitation.

If the solicitation is amended, the CEC will send an addendum to all entities that requested the solicitation, and will also post it on the CEC's website at: <https://www.energy.ca.gov/funding-opportunities/solicitations>. The CEC will not reimburse applicants for application development expenses under any circumstances, including cancellation of the solicitation.

2. Modification or Withdrawal of Application

Applicants may withdraw or modify a submitted application before the deadline to submit applications by sending a letter to the Commission Agreement Officer listed in Part I. Applications cannot be changed after that date and time. An Application cannot be "timed" to expire on a specific date. For example, a statement such as the following is non-responsive to the solicitation: "This application and the cost estimate are valid for 60 days."

3. Confidentiality

Though the entire evaluation process from receipt of applications up to the posting of the NOPA is confidential, **all submitted documents will become publicly available records** after the CEC posts the NOPA or the solicitation is cancelled. **The CEC will not accept or retain applications that identify any portion as confidential.**

4. Solicitation Errors

If an applicant discovers any ambiguity, conflict, discrepancy, omission, or other error in the solicitation, the applicant should immediately notify the CEC of the error in writing and request modification or clarification of the solicitation. The CEC will provide modifications or clarifications by written notice to all entities that requested the solicitation. The CEC will not be responsible for failure to correct errors.

5. Immaterial Defect

The CEC may waive any immaterial defect or deviation contained in an application. The CEC's waiver will not modify the application or excuse the successful applicant from full compliance with solicitation requirements.

6. Disposition of Applicant's Documents

Upon the posting of the NOPA, all applications and related materials submitted in response to this solicitation will become property of the State and publicly available records. Unsuccessful

applicants who seek the return of any materials must make this request to the Agreement Officer listed in Part I, and provide sufficient postage to fund the cost of returning the materials.

E. STAGE ONE: APPLICATION SCREENING

SCREENING CRITERIA <i>The Application must pass ALL criteria to progress to Stage Two.</i>	Pass/Fail
1. The application is received by the CEC's Contracts, Grants, and Loans Office by the due date and time specified in the "Key Activities Schedule" in Part I of this solicitation and is received in the required manner (e.g., no emails or faxes).	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
2. The application Form (Attachment 1) is signed where indicated.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
3. The Applicant Declaration Form (Attachment 12) is signed where indicated.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail

The CEC may have waived the requirement for a signature on application materials for this solicitation. If a notice regarding CEC's waiver of the signature requirement appears here: <https://www.energy.ca.gov/funding-opportunities/solicitations>, the waiver applies to this solicitation. In the event of a conflict between the notice and any language in this solicitation regarding signatures, the notice will govern.

F. STAGE TWO: APPLICATION SCORING

Proposals that pass ALL Stage One Screening Criteria and are not rejected as described in Section IV.C. will be evaluated based on the Scoring Criteria on the next page and the Scoring Scale below (with the exception of criteria 6–9, which will be evaluated as described in each criterion). Each criterion has an assigned number of possible points, and is divided into multiple sub-criteria. The sub-criteria are not equally weighted. The Project Narrative (Attachment) must respond to each sub-criterion, unless otherwise indicated.

SCORING SCALE

% of Possible Points	Interpretation	Explanation for Percentage Points
0%	Not Responsive	Response does not include or fails to address the requirements being scored. The omission(s), flaw(s), or defect(s) are significant and unacceptable.
10-30%	Minimally Responsive	Response minimally addresses the requirements being scored. The omission(s), flaw(s), or defect(s) are significant and unacceptable.
40-60%	Inadequate	Response addresses the requirements being scored, but there are one or more omissions, flaws, or defects or the requirements are addressed in such a limited way that it results in a low degree of confidence in the proposed solution.
70%	Adequate	Response adequately addresses the requirements being scored. Any omission(s), flaw(s), or defect(s) are inconsequential and acceptable.
75%	Between Adequate and Good	Response better than adequately addresses the requirements being scored. Any omission(s), flaw(s), or defect(s) are inconsequential and acceptable.
80%	Good	Response fully addresses the requirements being scored with a good degree of confidence in the applicant's response or proposed solution. No identified omission(s), flaw(s), or defect(s). Any identified weaknesses are minimal, inconsequential, and acceptable.
85%	Between Good and Excellent	Response fully addresses the requirements being scored with a better than good degree of confidence in the applicant's response or proposed solution. No identified omission(s), flaw(s), or defect(s). Any identified weaknesses are minimal, inconsequential, and acceptable.
90%	Excellent	Response fully addresses the requirements being scored with a high degree of confidence in the applicant's response or proposed solution. Applicant offers one or more enhancing features, methods or approaches exceeding basic expectations.

% of Possible Points	Interpretation	Explanation for Percentage Points
95%	Between Excellent and Exceptional	Response fully addresses the requirements being scored with a better than excellent degree of confidence in the applicant's response or proposed solution. Applicant offers one or more enhancing features, methods or approaches exceeding basic expectations.
100%	Exceptional	All requirements are addressed with the highest degree of confidence in the applicant's response or proposed solution. The response exceeds the requirements in providing multiple enhancing features, a creative approach, or an exceptional solution.

ADDITIONAL SCREENING CRITERIA FOR PAST PERFORMANCE

Screening Criteria	
<p>Applicant Past Performance with CEC</p> <p>The applicant—defined as at least one of the following: the business, principal investigator, or lead individual acting on behalf of themselves—received funds from the CEC (e.g., contract, grant, or loan) and entered into an agreement(s) with the CEC and demonstrated severe performance issues characterized by significant negative outcomes including:</p> <ul style="list-style-type: none"> • Significant deviation from agreement requirements; • Termination with cause; • Demonstrated poor communication, project management, and/or inability, due to circumstances within its control, from materially completing the project; • Quality issues with deliverables including poorly written final report that prevents publishing • Severe unresolved negative audit findings. 	
Must pass to continue with Scoring Criteria	Pass/Fail

SCORING CRITERIA

The Project Narrative (Attachment) must respond to each criterion below. The responses must directly relate to the solicitation requirements and focus as stated in the solicitation. Any estimates of energy savings or GHG impacts should be calculated as specified in the References for Calculating Energy End-Use and GHG Emissions (Attachment), to the extent that the references apply to the proposed project.

Scoring Criteria	Maximum Points
<p>1. Technical Merit</p> <ul style="list-style-type: none"> a. The proposed project provides a clear and concise description of the technological, scientific knowledge advancement, and/or innovation that will overcome barriers to achieving the State’s statutory energy goals. b. Describe how the proposed model/tool/study will be used by key stakeholders (e.g., policy-makers, project developers, other researchers, etc.). 	15

Scoring Criteria	Maximum Points
<ul style="list-style-type: none"> c. Describes the advantage of the proposed model/tool/study over that currently being used by key stakeholders. d. Provides information described in Section I.C. 	
<p>2. Technical Approach</p> <ul style="list-style-type: none"> a. Proposal describes the technique, approach, and methods to be used in performing the work described in the Scope of Work. b. The Scope of Work identifies goals, objectives, and deliverables, details the work to be performed, and aligns with the information presented in Project Narrative. c. Proposal identifies the reliability that the project and site recommendations as described will be carried out if funds are awarded. d. Identifies and discusses factors critical for success, in addition to risks, barriers, and limitations (e.g. loss of demonstration site, key subcontractor). Provides a plan to address them. e. Discusses the degree to which the proposed work is technically feasible and achievable within the proposed Project Schedule and the key activities schedule in Section I.E. f. Describes the knowledge transfer plan, including how key stakeholders and potential users will be engaged, and the plan to disseminate knowledge of the project's results to those stakeholders and users. g. Provides a clear and plausible measurement and verification plan that describes how energy savings, air emissions reductions, GHG reductions, and other benefits specified in the application will be determined and measured. h. Provides information documenting progress towards achieving compliance with the California Environmental Quality Act (CEQA) by addressing the areas in Section I.I and Section III.D.3., and Section III.D.8. i. Provides information described in Section I.C. 	25
<p>3. Impacts and Benefits for California IOU Ratepayers</p> <ul style="list-style-type: none"> a. Explains how the proposed project will benefit California Natural Gas Investor-Owned Utility (IOU) ratepayers and provides clear, plausible, and justifiable (quantitative preferred) potential benefits. Estimates the energy benefits including: <ul style="list-style-type: none"> • Annual natural gas savings (therms) <p>In addition, estimates the non-energy benefits including:</p> <ul style="list-style-type: none"> • greenhouse gas emission reductions, air emission reductions (e.g., criteria pollutants), cost reduction, and/or increased safety. 	20

Scoring Criteria	Maximum Points
<ul style="list-style-type: none"> b. States the timeframe, assumptions with sources, and calculations for the estimated benefits, and explains their reasonableness. Include baseline or “business as usual” over timeframe. c. Identifies how outputs of the study will benefit key stakeholders (e.g., streamline planning, help eliminate barriers, stimulate growth of applicable market sectors). 	
<p>4. Team Qualifications, Capabilities, and Resources</p> <p>Evaluations of ongoing or previous projects including project performance by applicant and team members will be used in scoring for this criterion. This can include contacting references.</p> <ul style="list-style-type: none"> a. Identifies credentials of prime and any subcontractor key personnel, including the project manager, principal investigator and technology and knowledge transfer lead (<i>include this information in the Project Team Form</i>). b. Demonstrates that the project team has appropriate qualifications, experience, financial stability and capability to complete the project. c. Explains the team structure and how various tasks will be managed and coordinated. d. Describes the facilities, infrastructure, and resources available that directly support the project. e. Describes the team’s history of successfully completing projects in the past 10 years including subsequent deployments and commercialization. 	15
<p>Total Possible Points for criteria 1– 4 (Minimum Passing Score for criteria 1– 4 is 70% or 52.50)</p>	75
<p>5. Budget and Cost-Effectiveness</p> <ul style="list-style-type: none"> a. Budget forms are complete for the applicant and all subcontractors, as described in the Budget instructions. b. Justifies the reasonableness of the requested funds relative to the project goals, objectives, and tasks. c. Justifies the reasonableness of direct costs (e.g., labor, fringe benefits, equipment, materials & misc. travel, and subcontractors). d. Justifies the reasonableness of indirect costs (e.g., overhead, facility charges (e.g., rent, utilities), burdens, subcontractor profit, and other like costs). 	10
<p>6. CEC Funds Spent in California</p> <p>Projects that maximize the spending of CEC funds in California will receive points as indicated in the table below (see CEC Funds Spent in California and California-Based Entities section for more details).</p>	10

Scoring Criteria	Maximum Points																				
<table border="1"> <thead> <tr> <th>Percentage of CEC funds spent in CA vs Total CEC funds requested (derived from budget Attachment)</th><th>Percentage of Possible Points</th></tr> </thead> <tbody> <tr><td>>60%</td><td>20%</td></tr> <tr><td>>65%</td><td>30%</td></tr> <tr><td>>70%</td><td>40%</td></tr> <tr><td>>75%</td><td>50%</td></tr> <tr><td>>80%</td><td>60%</td></tr> <tr><td>>85%</td><td>70%</td></tr> <tr><td>>90%</td><td>80%</td></tr> <tr><td>>95%</td><td>90%</td></tr> <tr><td>>98%</td><td>100%</td></tr> </tbody> </table>	Percentage of CEC funds spent in CA vs Total CEC funds requested (derived from budget Attachment)	Percentage of Possible Points	>60%	20%	>65%	30%	>70%	40%	>75%	50%	>80%	60%	>85%	70%	>90%	80%	>95%	90%	>98%	100%	
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<p>7. Ratio of Direct Labor to Indirect Costs</p> <p>The score for this criterion will be calculated by the following formula:</p> $\frac{\text{Total Direct Labor}}{\text{Total Direct Labor} + \text{Total Fringe} + \text{Total Indirect} + \text{Total Profit}}$ <p>This ratio will then be multiplied by the maximum possible points for this criterion and rounded to two decimal places.</p> <p>NOTE: For the purposes of this criterion, the CEC will include the facility charges (e.g., rent, utilities, etc.), burdens and other like costs that are budgeted as direct costs into the indirect costs in the formula.</p>	5																				
<p>Total Possible Points (Minimum Passing Score for Criteria 1 – 7 is 70% or 70.00)</p>	100																				

Scoring Criteria	Maximum Points												
Preference Points Applications must meet both minimum passing scores (Scoring Criteria 1-4, and 1-7) to be eligible for the additional points.													
<p>8. California Based Entities (CBE) Preference Points</p> <p>Projects that maximize the spending of CEC funds on California Based Entities will receive points as indicated in the table below (see Funds Spent in California and California-Based Entities section for more details).</p> <p>Projects that meet these requirements will receive preference points as indicated below:</p> <table border="1" data-bbox="204 636 1255 1050"> <thead> <tr> <th data-bbox="204 636 795 783">Percentage of PIER Natural Gas Funds Allocated to CBEs (derived from budget attachment "Category Budget")</th><th data-bbox="795 636 1255 783">Percentage of Possible Points</th></tr> </thead> <tbody> <tr> <td data-bbox="204 783 795 840">> 60%</td><td data-bbox="795 783 1255 840">20%</td></tr> <tr> <td data-bbox="204 840 795 894">> 70%</td><td data-bbox="795 840 1255 894">40%</td></tr> <tr> <td data-bbox="204 894 795 949">> 80%</td><td data-bbox="795 894 1255 949">60%</td></tr> <tr> <td data-bbox="204 949 795 1003">> 90%</td><td data-bbox="795 949 1255 1003">80%</td></tr> <tr> <td data-bbox="204 1003 795 1050">=100%</td><td data-bbox="795 1003 1255 1050">100%</td></tr> </tbody> </table>	Percentage of PIER Natural Gas Funds Allocated to CBEs (derived from budget attachment "Category Budget")	Percentage of Possible Points	> 60%	20%	> 70%	40%	> 80%	60%	> 90%	80%	=100%	100%	<p>5</p>
Percentage of PIER Natural Gas Funds Allocated to CBEs (derived from budget attachment "Category Budget")	Percentage of Possible Points												
> 60%	20%												
> 70%	40%												
> 80%	60%												
> 90%	80%												
=100%	100%												

9. Match Funds**5**

- a. Cash match share is preferred; however, in-kind cost share is permitted and will be considered for solicitation match requirements. Points for this criterion will be evaluated based on the proposed cash match relative to the total match (cash + in-kind) contributions using the Cash Match Scoring Table:

Cash Match Scoring Table

Percentage of Proposed Cash Match Funds	Score
80 to 100%	5
60 to <80%	4
40 to <60%	3
20 to <40%	2
10 to <20%	1

- b. Additional points will be awarded to applications that exceed the minimum match requirements based on the percentage amount above minimum using the Exceeds Minimum Match Scoring table:

5**Exceeds Minimum Match Scoring Table**

Percentage above Minimum Match (cash and in-kind)	Score
≥ 80%	5
60 to <80%	4
40 to <60%	3
20 to <40%	2
10 to <20 %	1